



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,517	04/16/2004	Steven Bailey	MS307681.01 / MSFTP622US	1944
27195 7590 04/19/2007 AMIN. TUROCY & CALVIN, LLP 24TH FLOOR, NATIONAL CITY CENTER 1900 EAST NINTH STREET CLEVELAND, OH 44114			EXAMINER EHICHIOYA, FRED I	
			ART UNIT 2162	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/19/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/826,517

Applicant(s)

BAILEY ET AL.

Examiner

Fred I. Ehichioya

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 18, 20 - 24 and 26 - 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 18, 20 - 24 and 26 - 30 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 – 18, 20 – 24 and 26 - 30 are pending in this Office Action.
2. Claims 19 and 25 are cancelled.

Response to Arguments

3. Argument regarding claim rejections under 35 USC § 101:

Applicant's argument regarding claims 20 is persuasive; therefore, rejection of claim 20 under 35 USC § 101 is hereby withdrawn. However, argument regarding claims 1, 12, 21 and 26 is not persuasive; therefore, rejections of claims 1, 12, 21 and 26 under 35 USC § 101 is maintained.

4. Applicant's cancellation of claims 19 and 25 overcomes the claim objections of claims 19 and 25; therefore, claim objection regarding claims 19 and 25 is hereby withdrawn.

5. Applicant argues:

(a) Chen is silent regarding a lock manager that acquires a parent lock on resource(s) of database where the parent lock has a reference count of the child lock (page 9, paragraph 2).

Examiner respectfully disagrees with the applicant. Chen discloses a lock a manager that manages and controls the allocation of locks of a set of resources/nodes (column 6, lines 1 – 12). These nodes include root/parent nodes and leaf/child nodes.

Art Unit: 2162

Chan discloses a reference count that is inherently for a child lock as shown on column 12, lines 34 - 44. Chan also discloses releasing all lock manager instances that inherently includes releasing parent lock when child lock is released as shown in column 12, lines 45 - 49; however, applicant states that Chan is silent on regarding "a lock manager that acquires a parent lock on resource(s) of database where the parent lock has a reference count of the child lock". Examiner reiterates that silent does not mean that Chan did not disclose applicant's claimed limitations. As shown from column and lines above and the claim rejections under 35 U.S.C 102 below that is applicable herewith, Chan discloses "a lock manager that acquires a parent lock on resource(s) of database where the parent lock has a reference count of the child lock".

(b) Nowhere does the cited reference teach the parent lock is released upon release of all child locks associated therewith (page 10, paragraph 1).

Examiner respectfully disagrees with the applicant. Chan discloses releasing all lock manager instances as shown in column 12, lines 44 – 49. This includes releasing all leaf node/child locks and root node/parent locks.

(c) Detlefs et al. fails to teach or suggest a lock manager that acquires a parent lock on resource of database (page 11, paragraph 1).

Examiner respectfully disagrees with the applicant. As shown in response to argument (a) above and rejections under 35 U.S.C 103 below that is applicable herewith, the combination of Chen and Detlefs fairly suggests a lock manager that acquires a parent lock on resource of database.

(d) *Chen et al. is silent regarding a lock manager that acquires a parent lock on a resource of database, and so does not teach a computer executable component that acquires parent locks and child locks on a database resource, the parent lock with a reference count of a child lock (page 11, paragraph 2).*

Examiner respectfully disagrees with the applicant. As shown in response to argument (a) above and rejections under 35 U.S.C 103 regarding claim 26 below that is applicable herewith, the combination of Chen and Detlefs fairly teach a computer executable component that acquires parent locks and child locks on a database resource, the parent lock with a reference count of a child lock.

Claim Objections

6. Claim 26 is objected to as being not completely responsive. Any submission that is an amendment must comply with the manner of making amendments as set forth in 37 CFR 1.121(c)(2).

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 12, 21 and 26 is rejected under 35 U.S.C. 101 because:

The claimed invention does not accomplish a "practical application" as forth in MPEP 2106 (II) (A); therefore non-statutory. To accomplish a practical application the

Art Unit: 2162

claim must produce a "useful, concrete and tangible result." (State Street, 149 F.3d at 1373, 47 USPQ2d at 1601-02).

Regarding claim 26, this claim is directed to computer readable medium having stored thereon a data structure. The specification fails to provide antecedent basis for the term "medium" and should have been objected to (MPEP 608.01(o)), such that the term "medium" itself would have reasonably been interpreted by one of ordinary skill as other than physical articles or objects to act as a hardware component and realize its functionality. As such, the claim is not limited to useful manufactures within the meaning of 101, and since it's not a process, machine or composition of matter, it's non-statutory.

Regarding claims 27 - 30 and in view of MPEP 2106 (II) (A), are not statutory because they recite computing instructions and are merely descriptive and lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101; therefore non-statutory.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5 – 21 and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Chan et al., "Chan" (U.S. Patent No. 6,108,654).

Art Unit: 2162

Regarding claim 1, Chan teaches a computer implemented database management system comprising:

A lock manager that acquires a parent lock and a child lock on resource(s) of a database (column 6, lines 1 – 12: "Chan discloses a lock manager that manages and controls the allocation of locks in a system comprising of nodes; The nodes are translated to have root/parent node and leaf/child nodes"), the parent lock has a reference count of the child lock (col. 12, lines 34-44: "Chan discloses a reference counts that inherently include child lock"); and the parent lock is released upon release of child locks associated therewith (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated").

Regarding claim 5, Chan teaches the database management system of claim 1 further comprises a lock hierarchy designated by the lock manager (col. 11, lines 3-4).

Regarding claim 6, Chan teaches the database management system of claim 5, the lock hierarchy comprises at least one of a database lock, page lock, table lock and row lock (col. 3, lines 34-36).

Regarding claim 7, Chan teaches the database management system of claim 5 further comprising a page scan optimization that maintains a last child lock until a next one is acquired (col. 6, lines 13-18).

Regarding claim 8, Chan teaches the database management system of claim 1, the parent lock is an intent lock that protects resource at lower level (col. 6, lines 53-64).

Regarding claim 9, Chan teaches the database management system of claim 5, the child lock is at least one of an exclusive, update and shared lock at a level of the hierarchy (col. 6, lines 52-59).

Regarding claim 10, Chan teaches the database management system of claim 1, the reference count is performed upon completion of a least one of a scan, query or operation (col. 12, lines 36-38).

Regarding claim 11, Chan teaches the database management system of claim 1 further comprises a pointer that can guide a release operation from each child lock to a respective parent lock (col. 6, lines 13-18).

Regarding claim 12, Chan teaches a computer implemented for controlling locks in a database management comprising:

defining a parent-child relationship among a plurality of locks in a lock hierarchy reference counting a child lock associated with parent lock (col. 6, lines 52-64: "Chan discloses a hierarchical lock levels of nodes that includes parent child relationships"), such that a parent lock maintains a count reference of respective child locks associated therewith (col. 12, lines 34-44: "Chan discloses a reference counts that inherently include child lock"); and

releasing a parent lock upon a release of all the respective child locks associated therewith (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated").

Regarding claim 13, Chan teaches the method of claim 12 the defining act further comprising arranging a top-down lock granularity based on logical or physical granularities of objects stored in the database (col. 3, lines 45-50):

Regarding claim 14, Chan teaches the method of claim 12 further comprising pointing to a parent lock upon releasing a respective child lock associated therewith (col. 3, lines 45-50).

Regarding claim 15, Chan teaches the method of claim 12 further comprising reference counting child locks directly associated with the parent lock (col. 12, lines 36-38).

Regarding claim 16, Chan teaches the method of claim 12 further comprising maintaining a reference count within a structure of the parent lock (col. 12, lines 34-44).

Regarding claim 17, Chan teaches the method of claim 12 further comprising scoping the reference counting of a lock to a transaction.

Regarding claim 18, Chan teaches scoping the reference counting of a lock to a transaction (column 12, lines 34 – 35).

Regarding claim 20, Chan a computer implemented database management system comprising:

Locking means for locking a resource on a database (col. 6, lines 1-6: “manager is a mechanism that manages and controls the allocation of locks in a system”), and means for determining a lifetime of the locking means (col. 6, lines 14-18: “the lock manager holds the lock for that process until the process indicates that the lock is no longer needed, at which time the lock can be validly released by the lock manager”).

Art Unit: 2162

Regarding claim 21, Chan teaches a computer implemented method for controlling locks in a database management, comprising:

reference counting child locks associated with a parent lock to obtain a reference count (col. 12, lines 34-36: "The reference count is the number of local processes currently attached to the recovery domain in the local lock manager instance");

releasing a child lock (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated"); and

decrementing the reference count by a value of one (col. 12, lines 62-64: "the reference count decrements accordingly").

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 - 4, 22 - 24, and 26 - 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Detlefs et al. "Detlefs" (Non Patent Literature "Lock-free reference counting").

Art Unit: 2162

Regarding claims 2 and 22, Chan discloses the claimed subject matter as discussed in claim 1. Chan does not explicitly teach zero value as claimed.

However, Detlefs discloses the parent lock is released upon the reference count attainment of a zero value (page, 191, col. Left column, Paragraph 2: "In order to maintain accurate reference counts, we would like to be able to atomically create a pointer to an object and increment that object's reference count, and to atomically destroy a pointer to an object and decrement its reference count. By freeing an object when and only when its reference count becomes zero, we can ensure that objects are not freed prematurely, but that they are eventually freed when no pointers to the object remain").

It would have been obvious to one of ordinary skill in the art at the time of present invention to combine the cited references because Detlefs teaching of decrementing "reference count to zero" would have allowed Chan's system to enable the root or parent node to be aware that there no sub-process/child lock associate therewith. This will allow a strong synchronization operation on pointers as suggested by Detlefs on page 198, section 7.

Regarding claims 3 and 23, Chan does not explicitly teach monitoring as claimed.

Detlefs disclose a lock monitoring system that monitors the reference count of child locks associated with the parent lock (page 196, section 5, left column, paragraph 3 "thus . . . exists").

Regarding claim 4, Chan teaches the database management system of claim 1, as each child lock is released the reference count of the parent lock decrements by a values of one (col. 12, lines 43-44).

Regarding claim 26, Chan teaches a computer-readable medium having stored thereon a data structure comprising:

a computer executable that acquires parent locks and child locks on a database resource (col. 4 lines 43-44), the parent lock with a reference count of the child lock (col. 12, lines 34-44).

Chan does not explicitly teach zero count as claimed.

However, Detlefs discloses the parent lock released upon the reference count attainment of a zero count (page, 191, col. Left column, Paragraph 2: "In order to maintain accurate reference counts, we would like to be able to atomically create a pointer to an object and increment that object's reference count, and to atomically destroy a pointer to an object and decrement its reference count. By freeing an object when and only when *its reference count becomes zero*, we can ensure that objects are not freed prematurely, but that they are eventually freed when no pointers to the object remain").

It would have been obvious to one of ordinary skill in the art at the time of present invention to combine the cited references because Detlefs teaching of decrementing "reference count to zero" would have allowed Chan's system to enable the root or parent node to be aware that there no sub-process/child lock associate therewith. This

Art Unit: 2162

will allow a strong synchronization operation on pointers as suggested by Detlefs on page 198, section 7.

Regarding claim 27, Detlefs discloses the computer readable medium of claim 26 further comprising a further computer executable component that monitors the reference count (page 196, Left column, paragraph 3: "Thus . . . exists").

Regarding claim 28, Detlefs teaches the computer readable medium of claim 26 further comprising a further computer executable device that identifies a parent lock associated with a released child lock (Page 197, left column, "LFRCstore . . . it points")

Regarding claim 29, Detlefs discloses the computer readable medium of claim 26 further comprising probabilistic classification models (page 193 section 3 #4).

Regarding claim 30, Deflefs the computer readable medium of claim 26, the reference count is the count of direct child locks associated wit the parent lock (page 196, sect. 5, col. Left, paragraph 1: "the basic idea . . . pointers to the objects").

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred I. Ehichioya whose telephone number is 571-272-4034. The examiner can normally be reached on M - F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Art Unit: 2162

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Fred I. Ehichioya
Patent Examiner
Art Unit 2162



April 9, 2007



Cam U. Tuong
primary Examiner